

In The Specification:

On page 2, please replace the paragraph starting on line 11 with:

a1
“One aspect of the invention is a torque controller to control output power to at least two shafts. The torque controller comprises a differential having at least a first and a second shaft, each shaft having an interface to a transfer assembly. The torque controller further comprises at least a first and a second transfer assembly, the transfer assemblies connected to each interface and to the differential. The torque controller also comprises a torque difference source connected to each transfer assembly, wherein the first output shaft and transfer assembly receive work from the differential, and the second transfer assembly and output shaft receive work from at least the torque difference source.”

On page 10, please replace the paragraph starting on line 23 with:

a2
“In the case where the right wheel slips, power transfer is desired from right to left, the following sequence occurs. Controller 64 communicates with the wheel speed sensors and yaw sensors to determine that the right wheel has a significantly greater speed than the left wheel, and that the vehicle is not turning. Controller 64 determines a voltage and frequency of excitation to send to the pole windings 5355 of inner rotor 54. The excitation generates a magnetic field and causes a drag on the outer rotor 56. Thus, faster-rotating inner rotor 54 slows down while slower-rotating outer rotor 56 is speeded up. The faster rotating outer rotor 56 then speeds up left gear train 51 in left transfer assembly 50, and interface 48 and left half shaft 46 speed up as a result of greater torque, while the right half shaft 62 slows down.”

On page 11, please replace the paragraph starting on line 18 with:

a3
“The mechanical links to the torque difference source are through left and right side gear trains. Left side transfer assembly 113 has an output shaft 120 with gear 121 meshing with gear 123 of the outer rotor 129 of the torque difference source. On the right side, transfer assembly 115 has an output shaft 119 and gear 122 meshing with gear 131124 on an inner rotor 131 of the torque difference source. The torque difference source 125 in this embodiment is a hydraulic vane pump configured as a bi-

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directional hydraulic motor. The torque difference source includes housing 127, outer rotor 129, and inner rotor 131 with vanes 132 and oil seals 134 between the inner and outer rotors. The torque difference source generates drag between the inner and outer rotors by pumping hydraulic fluid with vanes 132. The pump may have an inlet/outlet circuit with a valve 133138 for controller 130 to control pressure within the source, for instance by relieving pressure. Sensors 71 monitor inner and outer rotor speeds and may be used to calculate torque."

a4

On page 12, please replace the paragraph starting at line 8 with:

"To illustrate the workings of this hydraulic embodiment, assume the right wheel has slipped and sensors 34 have detected an increase in the speed of the right wheel and right shaft 103. Controller 130 detects this difference in wheel speed. The increase in speed of right shaft 103 is transmitted through interface 107, gear train 117 of transfer assembly 115, shaft 119 and gears 122 and 124. In one embodiment, the gear train from 107 through 119, axle to shaft 119) is a 4:1 slow down (4:1 speed up from shaft 119 to axle). If the gear train has a different ratio of speed up or slow down, the speed difference from axle to output shaft of the transfer assembly will manifest itself as a different output speed, but will nevertheless cause an increase in speed to gear 124 and inner rotor 131."

a5

On page 12, please replace the paragraph starting on line 19 with:

"The inner rotor will spin more rapidly and generate more friction and drag on the outer rotor 129. Controller 130 may exercise control over the friction by opening valve 133138 and causing the hydraulic fluid to do work outside the differential-transfer assembly-torque difference source circuit. With outer rotor 129 now turning more rapidly, the gear train on the left in Fig. 5 speeds up, through gears 123, 121 and shaft 120. Transfer assembly 113 and gear train 111 may be a 4:1 speed up train, delivering shaft power to interface 105 and Left half shaft 101. Left half shaft 101 speeds up in proportion to the torque transferred from inner rotor 131 to outer rotor 129. The left half shaft now has increased torque to transfer to the left wheel and keep the vehicle moving. In this embodiment, the torque difference source removed torque from

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spinning right half shaft 103 and transferred it to gripping left half shaft 101. The torque on the shafts is not equal, and the left half shaft now has the torque to power the vehicle until it gets back to a steady grip for both wheels."

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On page 13, please replace the paragraph starting on line 10 with:

"Figs. 6-8 depict details of the inner and outer rotors of the hydraulic bi-directional motor used in Fig. 5. Fig. 6 is a cross sectional view of the torque difference source 125 of Fig. 5. The housing 127 surrounds the outer rotor 129 and inner rotor 131. Vanes are attached to the inner rotor 131. Inner rotor 131 may be ovate or eccentrically shaped, as shown, so that vanes 131132 slide in and out as the rotor rotates. Inlet 139 is connected to ports 139135 and outlet 140 is connected to ports 137. The inlet ports are located at 180° to each other and at 90° to the outlet ports. The outlet ports are also located at 180° to each other. The ports may be located in port plates at the axial ends of the motor. The drag of the vanes creates a torque opposite the direction of rotation of the inner rotor 131. The hydraulic fluid within the pump transfers the torque to the outer rotor 129."

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On page 16, please replace the paragraph beginning on line 1 with:

"Fig. 10 depicts a schematic representation of the control system for the hydraulic-pneumatic embodiment. Pneumatic controller 187 is in communication with vehicle controller 31, which may be an engine control unit (ECU) or other computer or microprocessor computer. The controller controls two 3-way PWM-controlled solenoid valves 136, 138, which control the flow of compressed air from a tank 181 to the torque difference source. The controller controls the direction of flow of pressurized air for either clock-wise or counter-clockwise application to the hydraulic vane pump. In one example, for clockwise flow, valve 179 receives pressurized air from tank 181 and routes it to inlet 189. Valve 180 then routes the return flow from outlet 190 to the return line of the tank 181. For counter-clockwise application, the valve positions are reversed. The controller can control the pressure and flow by rapidly opening and closing the valves to achieve the desired effect. Pressure sensors 188 assist the controller in controlling the valves. While pressure sensors are preferred, flow sensors

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w may also be used to control the valves. The pneumatic version may also have a valve 186 under the control of controller 187 on a loop for bleeding pressure when desired."